



Communicable Disease and Epidemiology News

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Jane Koehler, DVM, MPH, Editor



Public Health
Seattle & King County
HEALTHY PEOPLE. HEALTHY COMMUNITIES.
Epidemiology, Prevention Division
First Interstate Center
999 Third Avenue, Suite 900
Seattle, WA 98104-4039
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Pet Reptile-Associated Salmonellosis in King County

Since 1995, 66 cases (4.6%) of *Salmonella* reported in Seattle & King County had pet reptiles such as snakes, iguanas, geckos, lizards, and turtles implicated as the likely source of the infection. Of these reptile-associated cases, half occurred in children less than 5 years old and a quarter were in infants less than one year old. Thus far in 2001, 18 reptile-associated *Salmonella* cases have been reported in Seattle & King County; one-quarter of these cases occurred in immunocompromised persons. Cultures of the implicated pet were obtained when permitted by the owner, including swabs of the interior wall of the terrarium, the water dish, areas where the reptile commonly rests, and a peri-cloacal swab of the reptile itself. Three reptiles were shedding the exact same *Salmonella* serotype as the infected individual, and three others were positive for *Salmonella* Arizonae, a serogroup commonly excreted by reptiles. The following illustrates a few such cases:

- Approximately two days after cleaning the terrarium of his red-tailed boa constrictor, a 20 year-old male developed gastrointestinal symptoms and was stool-culture positive for *Salmonella* Typhimurium. Stool and environmental cultures obtained from the snake also yielded *Salmonella* Typhimurium, identical by Pulse Field Gel Electrophoresis (PFGE) to the owner's stool culture isolate.
- While a family was caring for a friend's high desert tortoise, their 3 month-old infant developed fever and a diarrheal illness. *Salmonella* serogroup F, a serogroup seldom isolated in the U.S., was cultured from the infant's stool. Public Health cultured the turtle's environment and isolated *Salmonella* serogroup F (identical by PFGE to the infant's strain) from the interior of the terrarium.
- An 18 month-old male, who never handled the family's Mexican milk snake, developed a gastrointestinal illness; stool culture yielded *Salmonella* Monschaui, a rare serotype never previously isolated in Washington. Four of five swabs from the terrarium and the snake yielded multiple *Salmonella* species. *Salmonella* Monschaui isolated from the terrarium matched the infected child's by PFGE, and *Salmonella* Arizonae was also cultured from the snake.

Reptiles are asymptomatic, chronic carriers of *Salmonella*, and shed the bacteria intermittently in their feces. ***Salmonella* can be acquired by direct contact with the feces of a reptile, by contact with contaminated objects such as cages or feeding dishes, sinks used to wash pet dishes, or by exposure to common household areas where pets are allowed to move freely.** Toddlers and infants who come into contact with these surfaces are at greater risk of acquiring *Salmonella*; adults who handle reptiles without thorough hand-washing afterwards can contaminate items throughout the home. Thorough hand-washing with soap and water and restricted handling of the reptile may reduce the risk of acquiring *Salmonella* from reptiles,

however, immunocompromised individuals, daycares, classrooms, and homes with children less than five years old should not have reptiles as pets based on the risks associated with these species. Attempts to rid reptiles of *Salmonella* carriage with antibiotic treatment will be ineffective, and may result in the carriage of antibiotic resistant strains.

From the 1950's to the 1970's, small red-eared slider turtles kept as household pets were a common source of *Salmonella* infections. As part of a nation-wide effort to remove this source of *Salmonella* from homes, the Washington Administrative Code (WAC) prohibited the sale of and display of turtles with a carapace measuring less than 4 inches. Though a noticeable decrease in turtle-associated cases has been noted in the literature since the sale of these small turtles has been regulated, larger reptiles, such as iguanas and snakes, have increased in popularity as pets and these larger reptiles have been increasingly implicated as a source of *Salmonella* infection. American Veterinary Medical Association data show that homes with at least one reptile kept as a pet in the U.S. increased from 850,000 in 1991 to over 2.7 million homes in 1998.

Health care providers should counsel patients that reptiles should not be kept in homes with children less than 5 years of age, or in homes where any immunocompromised person lives. The presence of a reptile kept in the home of a person with a diarrheal illness should increase the suspicion of salmonellosis, and the patient's stool should be cultured. For further information about reptile-associated salmonellosis, see the CDC's website at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4844a1.htm>

A Construction Worker with Fever, Pneumonia, and Liver Dysfunction

A previously healthy 34-year-old construction worker presented to a local emergency department with a two-day history of fever to 105°F, sore throat, coryza, dry cough, severe headache, nausea and vomiting. Rapid strep test, urinalysis (U/A), and chest x-ray were normal; the WBC count was 14,000/mm³ with 44% bands. The patient was diagnosed with a "viral syndrome" and discharged. Two days later the patient presented with worsening symptoms, continued fever with rigors and increased myalgias. He was born in Tonga and lived in Samoa until moving to the U.S. in 1995; he traveled to Tonga in March 2001. There were no ill contacts. There were no risk factors for HIV infection. The patient has dogs, and reported no additional animal contact.

Vital signs at admission were: HR 101, BP 94/57, RR 16-23, T 38.5°C. On physical exam the conjunctiva were injected; there was no rash, adenopathy or organomegaly; the neck was painful to move, but not stiff. Admission lab results showed WBC 12,300/mm³ (77% PMN, 12% bands), platelet count 30,000/mm³, mildly elevated ALT, AST and alkaline phosphatase with normal bilirubin. The U/A was positive for protein and blood. The chest x-ray now showed bilateral infiltrates. The patient was admitted to the hospital and treated with IV azithromycin for atypical community-acquired pneumonia. Over the first 48 hours of hospitalization the patient

developed jaundice and marked liver function abnormalities with the total bilirubin subsequently reaching 18.3mg/dl. Mild renal dysfunction developed. Cultures and examination of blood and bronchoalveolar lavage fluid were unrevealing. Azithromycin was discontinued and empiric treatment with doxycycline and ampicillin was initiated for a presumed diagnosis of leptospirosis.

Leptospirosis is a zoonotic disease acquired by humans through direct contact with infected animals or exposure to fresh water or soil contaminated by infected animal urine. The spectrum of illness ranges from subclinical to a self-limited febrile illness (about 90% of cases) to a severe potentially fatal illness with any combination of renal failure, hepatic failure and pneumonitis. Both self-limited and severe forms of illness progress through an acute septicemic phase followed by an immune phase of disease.

The incubation period is usually 5-14 days but may be greater than 30 days. Symptoms of the acute phase in decreasing order of frequency include high fever, chills, rigors, and myalgias, conjunctival suffusion, abdominal pain, anorexia, nausea, vomiting, diarrhea, cough and pharyngitis; a pretibial maculopapular rash may be present. Conjunctival suffusion and muscle tenderness, particularly in the calf and lumbar area, are the most useful physical findings; lymphadenopathy, splenomegaly and hepatomegaly are less common.

The immune phase of illness follows and lasts 4-30 days. Production of IgM antibody coincides with disappearance of leptospires from blood and CSF. Aseptic meningitis is characteristic of the immune phase of illness. Weil's disease is characterized by impaired renal and hepatic function, at times associated with hemorrhagic pneumonitis, cardiac arrhythmia, and circulatory collapse. Thrombocytopenia occurs in the absence of DIC. Pulmonary involvement is common in leptospirosis.

Isolation of leptospires from clinical specimens is difficult and takes weeks to months. The diagnostic test of choice is acute and convalescent serology performed at the CDC Leptospirosis Reference Laboratory and available through Public Health. The current case was confirmed at CDC with seroconversion to several leptospiral serovars. Doxycycline and penicillin (or ampicillin or amoxicillin) are recommended for treatment of leptospirosis.

It is estimated that 100-200 leptospirosis cases are identified annually in the United States with about 50% of cases occurring in Hawaii. Although incidence in the United States is relatively low, leptospirosis is considered to be the most widespread zoonotic disease in the world. Persons at-risk for leptospirosis include workers in rice fields, sugar cane plantations, mines, sewer systems, and slaughterhouses; animal caretakers and veterinarians; and travelers to tropical parts of the world involved in recreational activities in fresh water. Recreational exposures can include rafting, kayaking, and swimming. The current case may have been infected through contact with infected water at a construction site or through

exposure to a stream in the vicinity of his King County home.

Reported by Robert Rakita, MD, Virginia Mason Medical Center

Chickenpox in the Age of Varicella Vaccine

In the pre-vaccine era, approximately 4 million cases of chickenpox occurred in the United States each year, resulting in 11,000 hospitalizations and 105 deaths annually. Dr. Jane Seward of the Centers for Disease Control and Prevention (CDC) presented chickenpox data from three sites (Antelope Valley, CA: West Philadelphia; and Travis County, TX) where active surveillance has been conducted to monitor the effects of varicella vaccine on the incidence of chickenpox.

As of December 31, 2000, 26 million doses of varicella vaccine have been distributed in the U.S. Overall coverage rate for varicella vaccine in 19-35 month-old children in the U.S. was shown to be 64% in a July 2000 survey. This same survey revealed a 41% coverage rate in Washington's 19-35 month old children. The National Immunization Program has set a goal of 90% or greater coverage for children of this age group by 2010. Surveillance data from the three active surveillance sites indicates an 80% decline in chickenpox cases in the last half of 2000 compared to pre-vaccine rates of disease.

Because it is important to characterize the indigenously circulating strains of varicella virus *before* the disease becomes rare*, a National Varicella Virus Laboratory has now been established. **The CDC requests that providers who see chickenpox cases collect vesicular fluid or crust from lesions for viral isolation.** This is especially important if an outbreak involves both vaccinated and unvaccinated individuals. For information on collecting and submitting specimens for varicella virus isolation, please contact Chas DeBolt at Public Health at 206-296-4774. Public Health can arrange for the submission of specimens to the National Varicella Virus Laboratory.

**For example, there is no longer an indigenous strain of measles virus circulating in the United States. All measles cases in recent years, where virus has been available for molecular typing, have proved to be imported strains*

Disease Reporting (area code 206)
AIDS.....296-4645
Communicable Disease...296-4774
STDs.....731-3954
Tuberculosis.....731-4579
24-hr Report Line.....296-4782
Hotlines:
CD Hotline.....296-4949
HIV/STD Hotline.....205-STDs
<http://www.metro.gov/heath>

Reported Cases of Selected Diseases, Seattle & King County 2001				
	Cases Reported in August		Cases Reported through August	
	2001	2000	2001	2000
AIDS	18	27	229	150
Campylobacteriosis	35	43	214	226
Cryptosporidiosis	2	NR	15	NR
Chlamydial infections	392	531	2825	3061
Enterohemorrhagic <i>E. coli</i> (non-O157)	0	1	3	2
<i>E. coli</i> O157: H7	7	7	21	35
Giardiasis	15	19	92	151
Gonorrhea	176	109	1046	718
<i>Haemophilus influenzae</i> (cases <6 years of age)	0	0	0	0
Hepatitis A	3	12	14	76
Hepatitis B (acute)	1	4	25	29
Hepatitis B (chronic)	74	NR	382	NR
Hepatitis C (acute)	0	0	8	6
Hepatitis C (chronic, confirmed/probable)	124	NR	954	NR
Hepatitis C (chronic, possible)	71	NR	394	NR
Herpes, genital	42	59	481	550
Measles	0	0	12	2
Meningococcal Disease	0	1	6	11
Mumps	0	4	1	8
Pertussis	7	10	24	146
Rubella	0	0	1	1
Rubella, congenital	0	0	0	0
Salmonellosis	36	24	184	149
Shigellosis	12	13	73	127
Syphilis	5	8	39	55
Syphilis, congenital	0	1	0	1
Syphilis, late	4	1	30	16
Tuberculosis	8	10	90	77